

STATE OF ARIZONA • EMERGENCY MEDICAL SERVICES AND TRAUMA
SYSTEM

Curriculum
for the
Laryngeal Mask Airway (LMA)[®]

Course Description

This course is designed to provide instruction in a procedure for the use of the laryngeal mask airway (LMA) by the EMT-Intermediate '99 and Paramedic.

Prerequisites

1. The EMT must be a certified EMT-Intermediate '99 or Paramedic, with the approval of the administrative medical director.
2. The EMT-Intermediate '99 or Paramedic student shall be enrolled in a certified ALS training program.

Methodology

The student shall receive at least 1.0 hour of lecture (Module One) and 1.0 hour of skills practice and validation (Module Two).

Instructor

The instructor must be approved by the administrative medical director and meet the following requirements:

- a. Would qualify, under A.C.C. R9-25-312(D), to serve as a preceptor for a course at the level of EMT certification held by the EMT; and
- b. Is authorized to perform the supplemental skill.

Equipment

The Following equipment is required for the course:

- Body substance isolation (BSI) equipment
- LMA[®] Intubation Model with adapter and syringes sizes 3.0, 4.0, 5.0
- Skills evaluation form
- BVM
- OPA
- K-Y Jelly[®] or other water soluble lubricant
- Bite block
- LMA[®] Instruction Manual
- Suction device, tubing

Course Competencies:

Upon completion of the course, the student shall be able to:

1. List the indication, contraindication and side effects for LMA®.
2. Identify the equipment required for LMA®.
3. Describe and demonstrate body substance isolation (BSI) procedures required for use with the LMA®.
4. Describe and demonstrate procedures, including positioning the patient, for insertion of the LMA®.
5. Successfully insert the LMA®, ventilating the patient appropriately.
6. Describe documentation of LMA® procedure and patient assessment.
7. Discuss the role of medical direction and oversight in the use of the LMA®.
8. Identify common problems, probable cause and corrective action for each identified problem.
9. Complete a practical skills evaluation with 80% competency.

COURSE OUTLINE
Module One: Lecture

- I. Purpose and Description of Laryngeal Mask Airway (LMA) ®
 - A. The LMA® procedure is performed by an EMT-Paramedic or EMT-Intermediate '99 in compliance with on-line or off-line medical direction.
 - B. The EMT-Paramedic or EMT-Intermediate '99 documents the application of the LMA® device, patient assessment and response.
 - C. Placement of the LMA® is unaffected by in-line manual immobilization or the presence of a hard neck collar.
- II. Indication:
The management of the airway of an unconscious patient where endotracheal intubation is not available or has failed.
- III. Contraindications:
 - A. LMA® is contraindicated in the patients where evidence of emesis is present.

- B. Patients with known hiatal hernia
 - C. Patients with decreased pulmonary compliance, such as pulmonary fibrosis
 - D. Oral pharyngeal trauma
 - E. The patient's mouth will not open adequately to accommodate the LMA[®]
- IV. Precaution:
The LMA[®] does not protect the airway from effects of regurgitation and aspiration.
- V. Procedure:
- A. Demonstrate body substance isolation (BSI) procedures.
 - B. Assemble and prepare the equipment.
 - C. Preoxygenate the patient.
 - D. Test the device:
 - 1. Flex the tube up to but not beyond 180°. Do not kink the tube. If the tube kinks, discard the device.
 - 2. Carefully insert a syringe into the valve port and deflate the cuff so the cuff walls are somewhat flattened against each other. A small amount of air will prevent the tip of the LMA[®] from becoming flexed backward during insertion.
 - 3. Determine that there is no leak nor uneven bulging. The balloon shape should be elliptical.
 - E. Prior to insertion of the LMA[®], the cuff should be deflated so that it forms a smooth "spoon-shape" without wrinkles on the distal edge. The flat and smooth leading edge facilitates insertion and avoids contact with the epiglottis.
 - 1. Lubricate the posterior surface of the LMA[®] just prior to insertion to prevent drying of the lubricant.
 - 2. Lubricate using a water-soluble lubricant such as K-Y[®] Jelly. Use of lidocaine-containing lubricants with the LMA[®] is not recommended for various reasons, the most important being that lidocaine can delay the return of the patient's protective reflexes prior to removal of the LMA[®].

- F. Standard Insertion Technique
1. Extension of the head with flexion of the neck in the position normally used for tracheal intubation. This can be achieved by pushing the head from behind utilizing the non-dominant hand in order to prevent movement of the head during insertion.
 2. Keep the cuff tip pressing against the posterior pharyngeal wall during insertion to prevent entering the valleculae or the glottic opening and to avoid becoming caught against the epiglottis or the arytenoid.
 3. The inserting finger must press the tube upwards (cranially) during the insertion maneuver.
 4. Press the deflated cuff against the palate. The concavity flattens out along the posterior wall, thus avoiding anterior structures during insertion.
 5. Hold the LMA[®] like a pen, with the index finger placed at the junction of the cuff and the tube.
 6. The mask aperture must face forward and the black line on the airway tube should be oriented anteriorly toward the upper lip.
 7. Under direct vision, press the tip of the cuff upward against the hard palate and flatten the cuff against it.
 8. Further open the mouth to make it easier to visualize; verify the position of the mask, and insert the index finger further into the mouth during the insertion.
 9. Push the jaw downwards with the middle finger or have another person pull the lower jaw downwards momentarily.
 10. Using the index finger to guide the LMA[®], press backwards toward the ears in one smooth movement. **Do not force.**
 11. Advance the LMA[®] into the hypopharynx until a definite resistance is felt. The jaws should *not* be held open during this movement as it may allow the tongue and epiglottis to drop downwards and block passage of the mask.

12. Before removing the finger, the non-dominant hand is brought from behind the patient's head to press down on the LMA[®] from being pulled out of place when the finger is removed. This also permits completion of the insertion in the event full insertion is not achieved by the index finger alone.
 13. Check to ensure that the block line on the airway tube is oriented anteriorly toward the upper lip.
 14. Inflate the cuff with just enough air to obtain a seal. Never overinflate the cuff.
- G. Thumb Insertion Technique
1. This is suitable for patients in whom access to the head from behind is difficult or impossible.
 2. The LMA[®] is held with the thumb in the position occupied by the index finger in the Standard Insertion Technique.
 3. The tip of the mask is pressed against the front teeth and the mask is pressed posteriorly along the palate with the thumb.
 4. As the thumb nears the mouth, the fingers are stretched forward over the patient's face.
 5. Advance the thumb to its fullest extent. The pushing action of the thumb against the hard palate also serves to press the head into position. Neck flexion may be maintained with head support.
 6. Before moving the thumb, push the tube into its final position using the other hand.
- H. Ventilation
1. Connect the LMA[®] to the bag and use gentle manual ventilation, auscultate the anterolateral neck for abnormal sounds.
 2. The mask may leak slightly for the first three or four breaths before settling in position in the pharynx.
 3. Intermittent positive pressure is not appropriate since gastric distention is a hazard.

4. Bag-valve ventilation should reduce the amount of gastric distention. Gentle bag ventilation technique, ventilating only with enough force to see the chest rise. If any effort is necessary to bag ventilate the patient with the LMA[®] in place, mal-position of the LMA[®] should be suspected and quickly corrected.
 5. Leakages around the LMA[®], once it is positioned, suggest malposition, incorrect size, under or overinflation of the LMA[®] cuff. If the LMA[®] is too small, the addition of more air is not the solution. The LMA[®] should be removed, and a larger, more appropriately sized device should be placed.
- I. Securing the LMA[®]
1. Insert a bite block.
 2. Tape the bite block and airway tube together with the tube taped downwards against the chin.
 3. Keep the bite block in place until the LMA[®] is removed.
- J. Observe for signs of swallowing.
- K. Removal of the LMA[®]
- Indications: The patient shows signs of swallowing or airway problems persist, or ventilation is inadequate
1. Deflate the cuff and simultaneously remove the LMA[®] and bite block only when the patient can open the mouth on command.
 2. Verify airway patency and respiratory depth
 3. Perform oral suctioning as required
- VI. Problems/Probable Cause/Corrective Action
- A. Difficulty in negotiating the angle at the back of the tongue
1. The inserting finger must press the tube against the palate throughout the insertion maneuver. Otherwise, the tip may fold on itself or impact on an irregularity or swelling in the posterior pharynx, e.g., hypertrophied tonsils.
 2. If the cuff fails to flatten or begins to curl over as it is advanced, it is necessary to withdraw the mask and reinsert it.

3. In case of tonsillary obstruction, a diagonal shift of the mask is often successful.
 4. If difficulty persists, discontinue the procedure.
 - B. Leak around the cuff: Assess for displacement of the cuff during turning the head/patient.
 - C. Malposition of the LMA®
 1. Assess and observe for changes in tidal volume
 2. Assess for a smooth, oval neck swelling extending below the thyroid cartilage. If absent, this may indicate anterior misplacement of the mask tip into the laryngeal inlet.
 - D. Unexpected regurgitation
 1. Coughing or breathholding may be the first sign
 2. Remove the LMA®
 3. Suction the airway
 - E. If any airway problems persist, or ventilation is inadequate, the LMA® should be removed.
- VII. Documentation
 - A. Circumstances contributing to the decision for using the LMA®
 - B. Procedure, patient assessment and outcome
 - C. If an attempt was made without success

Module Two: Skills Practice/Validation
Approximate time: 90 minutes

- I. Provided models manikins and equipment necessary to insert the LMA® administration, the student shall:
 - A. List the indications, contraindications and side effects of the LMA®
 - B. Identify the equipment required
 - C. Describe and demonstrate body substance isolation (BSI) procedures required.
 - D. Describe and demonstrate aseptic technique.
 - E. Describe and demonstrate insertion techniques: standard and thumb insertion.
 - F. Describe and demonstrate documentation procedures.
 - G. Identify common problems, probable cause and corrective action for each identified problem.
- II. The student shall demonstrate minimum score accuracy on a skills evaluation form completed by the instructor.
- III. An instructor shall provide remediation and retesting as necessary.

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Proposed Skills Evaluation
Laryngeal Mask Airway (LMA) ®

Student's Name: _____

Date: _____ Attempt# _____

Evaluator: _____

Criteria	Points Possible	Points Attained
Describes and demonstrates BSI procedures, including aseptic technique	1	
Identifies need for the procedure: Assesses ABC's; determines inadequacy of ventilation	2	
Identifies the equipment required for insertion of the (LMA) ®	1	
Positions the patient: Positions the patient supine for standard insertion technique or the provider in front of the patient for thumb insertion	2	
Procedure: <ul style="list-style-type: none"> ●Pre-oxygenate the patient ●Test the device ●Lubricate the device ●Insert the (LMA) ® using the Standard Insertion Technique ●Insert the (LMA) ® using the Thumb Insertion Technique ●Ventilate ●Assess for leak ●Secure the (LMA) ® ●Observe for signs of swallowing ●Intubate the patient 	10	
Identifies common problems , probable cause and corrective action for each	4	
Reassess ventilation	1	
Describes and demonstrates removal of the LMA®	1	
Documents the procedure on an encounter form	1	
Total	23	

Critical Criteria

(Failure to meet any of the critical criteria constitutes failure. The student must be remediated prior to retesting.) The student has three (3) opportunities to successfully complete the test. If a student fails to achieve a passing grade after three (3) opportunities, the student must repeat the entire course.

___ Fails to properly demonstrate body substance isolation procedures

___ Fails to properly demonstrate the correct method for insertion of the LMA®

___ Fails to recognize problems with insertion of the LMA®

___ Fails to intubate the patient

___ Fails to identify corrective action for each recognized problem